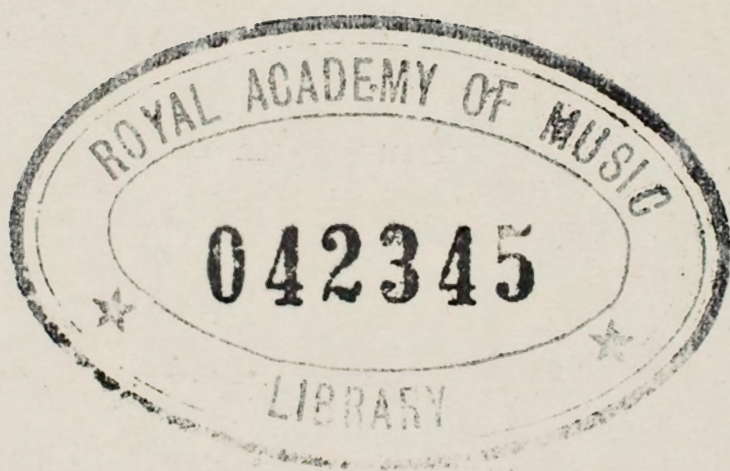




PIANO FALLACIES OF TO-DAY

by
TOBIAS MATTHAY



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PREFACE

THIS little booklet is a collection of six articles first written for *The Music Teacher*, and several additional ones, all designed to demolish certain stupidities and bogies rampant with regard to the processes of PIANO TECHNIQUE.

They are:—

- I The Gospel of Relaxation.
 - II The Doctrine of Stiffness.
 - III Weight-touch and Singing tone.
 - IV Finger Agility Technique.
 - V Forearm Rotation.
 - VI Key Sense *v.* Key-hitting.
 - VII The Psychological Error.
 - VIII Quality of Tone again.
 - IX The Scale Obsession (An Examination Crime).
- These are preceded by a *Preamble*.

TOBIAS MATTHAY



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PREAMBLE

THE six articles here reprinted from *The Music Teacher* were intended to combat a number of present-day fallacies with regard to piano-teaching, including that worst one of all—that of the Fixationists.

I believe BREITHAUPT was the culprit who first introduced this unfortunate term into Piano pedagogics, but I do not believe that he really meant 'Fixation' in the wicked sense of setting the limb by antagonistic conflict of its muscles. Anyone endowed with but the slightest mechanical and gymnastical instinct knows that one cannot effectively use a limb (or portion of it) without providing a stable basis for its action, and that during the moment of such action against an outside object there must consequently be a 'fixation' of the joint in question in the sense of its being rendered stationary by the momentary presence of such basis. This correct sensation has, however, been completely misinterpreted by the 'Fixationists'; they have misconstrued such *stability of the joint* to imply the exertion of the antagonistic muscles, in short, *limb-stiffness*! The Fixationists fail to realize that the necessary momentary stabilization of a joint (or living hinge) during work done is simply caused by the reaction of the working lever on one side of the joint (or hinge) against a base supplied at the other side of it—a conflict, therefore, between the exerted limb and its basis. For instance, the knuckle can be stabilized (or rendered immobile) by a down-action of the hand during the moment of the finger's down-action against the key, and consequent reaction upwards against the knuckle. Instead, they falsely assume that such stabilization of the hinge is caused by exertion of the contrary (or antagonistic) muscles of the working limb itself! The solution, however, is to omit all contra exertion (or Fixation) and supply only the needed exertion and the needed Base. Why, then, ever do anything to defeat our actions? It is only common sense, and the only truly 'scientific' solution of the problem!

One of the quite latest disciples of the Fixation school, however, has some inkling of the supreme folly of this tenet. After advocating antagonistic fixation all through his book,



he finally confesses that it should be used at its 'minimum' extent! Now, this is exactly what we Relaxationists have been shrieking for all these years! For the 'minimum' of antagonistic exertion surely can only refer to that *residual* tension of the muscles (tonicity) which cannot be avoided however much we may try! I may be told (by Fixationists) that I contradict myself, inasmuch as I do recommend that a slight actual stiffening of the finger itself is helpful when playing extremely softly, but such exceptional treatment is quite justified. The *law* of freedom is also not in the least affected when we find an artist using a certain degree of limb tension in louder passages, maybe for the duration of a whole phrase, and doing this for the sake of better enforcing or realizing a sense of *musical continuity* and also a sense of *tonal continuity*—in spite of our instrument's actual deficiency in this respect. Such exceptions, however, only prove the rule, for they are superimposed upon that sense of general freedom which is the secret of all facile Piano-technique, as it also is in all other gymnastic pursuits. Moreover, before adopting such refinements, one must certainly have in the first instance mastered perfect freedom in one's playing-actions, accuracy in tone-timing, and elimination of all 'Fixation'; and this certainly does not imply 'flabbiness', but, on the contrary: *unimpeded strength!*

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PIANO FALLACIES OF TO-DAY:

By TOBIAS MATTHAY

NUMBER ONE

THE GOSPEL OF RELAXATION

A GOOD deal of evidence has lately come to light showing how the term 'Relaxation' in connection with Piano playing is being quite seriously misunderstood and misinterpreted. It would, therefore, seem desirable in the public interest that a little illumination on this point should be forthcoming. I will try to provide it as concisely as possible.

To begin with, Relaxation in playing, certainly and positively and emphatically, does *not* lead to *Relaxation* Flabbiness, as some imagine or even assert; *does not* it does *not* imply the omission (neither fully nor *lead to* partly) of the exertions needed in all playing, but *Flabbiness* it simply means the omission (so far as possible) of all and any actions which may prevent or impede the free and full use of the needed muscles. The sole purpose of Relaxation is to enable us to *exert* our fingers and hands to their fullest capacity, so as to achieve the utmost accuracy. Much wrong thinking with regard to Relaxation arises, no doubt, from non-recognition of the fact that the term serves to express *three quite distinct things* in playing.

Thus we have:—

1. Relaxation of the up-holding muscles of the arm, when its weight is required as a basis for the finger and hand exertions.
2. Relaxation, in the sense of Cessation of all work and weight the moment these have fulfilled their purpose; and
3. Relaxation of the Antagonistic muscles so far as possible, i.e., relaxation of those muscles designed to supply the *opposite* exertions to the required ones.

This last fact has resulted in a veritable quagmire of foolish teaching. Let us try to be clear on this point. For every exertion we can make in one direction, we can also provide the opposite exertion. If we exert ourselves in both directions at the same time, we become 'muscle bound' (or 'muscle locked') and we are stiff, and the intended exertion of the limb is either partly or completely defeated.

On the other hand, to enable us effectively to exert our limbs (or portions of them) against any object, we must provide a STABLE BASIS for that action so that the whole power is transmitted to the business end, and not wasted by movement at the opposite end. Thus, to exert the finger against the key may demand a sufficient down-activity of the hand at the knuckle (but not necessarily a movement) so that no power is there wasted; and likewise, to enable us to exert our hand downwards at the knuckle demands that the requisite arm conditions take effect at the wrist joint. This required momentary 'stabilization' at the knuckle and wrist joints has led some to the stupid conclusion that the limb itself should purposely be stiffened by applying muscularly, that is, by the misuse of the aforesaid antagonistic exertion of *the same portion* of the limb! This is a piece of completely wrong diagnosis of what does happen in good playing, and is most dangerous pianistically, and bound to lead to failure. 'Fixation' is, therefore, a dangerous word when applied to any gymnastic pursuit. As to the assertion that stiffening of the limbs is necessary, surely it is the ideal of every gymnast that there must be perfect freedom from all *antagonistic* exertion so far as possible? Why, then, should it be different at the Piano?

It even applies in such a coarse pursuit as tree-felling! I remember trying in my younger days to fell a tree in my garden, hacking away at it, and covering the ground with splinters and myself with perspiration in futile efforts, when my gardener, looking on pityingly, took up the axe and with one free swing, cut the tree right through; and in explanation remarked: 'Why, Sir, don't you use "ARM-WEIGHT"! ' That was a nasty blow for the Apostle of Relaxation! But he was quite right, and my tree-felling was bettered for ever afterwards.

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Indeed, we must hold the axe firmly and plant our feet well as a basis, but the swing itself must be as FREE as possible, just as in golf or cricket; and at the Piano we must grip the keys well with our fingers and hands (during the moment of key-descent) but we must use them freely, and the necessary arm conditions must be correctly fulfilled!

No doubt there have been some who, casually coming across the term Relaxation, have jumped to the conclusion that it was comparable to 'that blessed word Mesopotamia'—that all one had to do would be to relax everything indiscriminately—and Piano salvation would at once be found! But it is criminal to ascribe the misdeeds of such stupid folk to the teachers of 'The Gospel of Relaxation'!

It has even been asserted that we cannot relax one portion of a limb while exerting another—that we cannot relax the arm for weight, etc., and yet exert the finger and hand against the keys! This is obvious nonsense. In Agility passages we can 'poise' the arm (i.e. by exertion of the up-muscles of the arm) and we can nevertheless allow the hand to lie loosely on the keys in between the sounding of the notes; or we can momentarily exert the hand and fingers (quite violently if need be) during the continuance of such self-supported condition of the arm; or we may use arm-weight (by relaxation) during tone production in slower passages; or we can, in addition, exert the forearm downwards in *fortes* to help the fingers, while yet leaving lax the upper-arm; and we can apply forearm rotatory changes quite independently of all this.

It has even been asserted that I, myself, teach Relaxation *without* teaching the necessary exertions! That this is—to put it politely—an inaccuracy, is proved by the fact that in my very *first* work on *The Technique, The Act of Touch*, pages 147 to 328 are devoted to an exposition of the necessary 'ACTIONS and inactions'; and on page 198 it is definitely stated that 'this relates to the *three muscular components* of the act of touch:—

- The Three Muscular Components*
1. Finger-exertion.
 2. Hand-exertion.
 3. Arm-weight and its co-operatives.'

Flabbiness may be fostered by some who profess to 'teach Matthey', but who have only cursorily glanced at my texts.



It reminds me of my young days, when I was an ardent Herbert Spencerian, and a neighbour tried to trounce me by holding forth 'Draper' as being far more up-to-date. One day I was in his library, and took down from the shelves his copies of Draper—and found the pages *uncut*! An author is quite defenceless in such cases!

Finally, the opposite to our 'Gospel of Relaxation' is then a doctrine of '*Defeatism*', and this, *Stiffness* incredible as it may seem, has lately been *Irreconcil-* deliberately taught by some! Instead of doing *able with* all we can to omit every action that will impede *Ease* or frustrate our obtaining complete agility and fullest tone, stiffness is actually advocated! This, however, must inevitably ruin all ease in Technique, and all accuracy in musical expression.

NUMBER TWO

THE DOCTRINE OF STIFFNESS

IN my last article I dealt with some fallacies which in recent years have gathered round the term *Relaxation*.

I now turn to the companion false picture of *Stiffness*, for there has of late been a recrudescence of the old teaching of actual stiffness, than which there could not be any worse folly. Although there are some who actually advocate stiffness, for the most part this error simply arises from lack of perception of the difference between these two quite distinct facts:—

1. The proper exertions required in all playing; and
2. The improper and never required Stiffness of the limb itself.

This confusion of thought has created a veritable quagmire of false notions.

Let us then first of all be clear as to what the term *Stiffness* really means in playing. It does *not* mean *The* stiffness of the joints caused by rheumatism, *Folly of* etc., nor does it refer to those momentary '*Stiffness*' exertions of the finger and hand (and forearm sometimes) which enable us to move the keys, nor to those which provide a basis for those actions. By the



term *Stiffness* is meant, only and solely, that condition of limb-stiffening which is wrought by exerting two sets of ANTAGONISTIC muscles simultaneously. For instance, you can pull your finger up, and you can pull it down, or your hand up or down, or your arm up or down, but if you make the up-exertion and the down-exertion at the same moment then the limb becomes more or less set, muscle-bound and stiff. . . . Stiffness implies muscular *defeatism*.

If you are foolish enough to supply these two opposite (antagonistic) exertions *equally*, then all movement becomes impossible, for there is no force available for it; whereas, if you supply them unequally then one exertion in a measure will overpower the other, and your playing actions will be impeded, clumsy and difficult. All muscular or gymnastic expertness and ease of Technique, therefore, immediately depends on our learning to keep *quite separate* such opposite muscular efforts. Once this fact is grasped there can no longer be any confusion between limb-stiffness and limb-exertion.

LLOYD MORGAN in his *Psychology for Teachers**, speaking of a country lad, at a night school, learning to write, says: 'there was hardly a muscle in his body that was not at work. His foot was hooked round the leg of his chair; his shoulders were set and strained; his head was screwed to one side; his tongue thrust into his cheek. *Over-production of active response* was exemplified throughout his whole frame. Selection of the essentials is reached by the *ELIMINATION OF ALL THIS REDUNDANCY* until only the BUSINESS-part of actual writing remains. THAT IS THE SECRET OF SKILL. It looks so graceful just because all but the essentials have been got rid of'.

Certainly, under a momentary stress of fear or anxiety we may tighten up every muscle in our body, but that is no valid argument for doing so at other times, when we are sanely trying to do our job successfully!

I have sometimes asked the question at examinations, 'What is Stiffness?' and have received the absurd answer, 'Oh, a stiffening of the muscles!' Of course, you cannot exert a muscle without 'stiffening' it, but that is quite a different thing from stiffening the *limb*. It is deplorable how the artistic temperament so often obliterates clear thinking

*Edward Arnold.



on the quite simple facts of muscular mechanics, and that is the main reason why artists are so often incapable of analyzing and diagnosing their own processes of playing for the pupil's benefit.

Real stiffness was no doubt deemed to be desirable in the dim past, when no exercise was considered to be beneficial unless it made arms and fingers ache! More recently this was taught with a difference; here one was told to practise 'as stiffly as possible' with 'knuckles in' and with the palm of the hand touching the keys, but the object here was that one should be *free* when it came to actual performance. Also it was admitted that it might be a dangerous exercise for a child. It was something to recognize this fact!

Then we have some artists who do not believe in 'the school of complete Relaxation' (whatever that may mean!) because in a vague, foggy way they do realise that in playing there *is* need for exertion of some kind. Or we have Pachmann touring the world for a season, wobbling his finger on held notes and vehemently protesting that this gives a tremulous effect to the sound! We know of an artist even of to-day who advocates Stiffness. He confesses that on a concert day he must practise for five hours beforehand so that he shall feel thoroughly stiff! Obviously, he is again confusing real stiffness with those necessary but *freely* given exertions needed in playing. What different picture is that of Eugen d'Albert who in his prime was one of the finest Piano-colourists we have ever had. One day he very kindly offered to play through to me my own Concert piece, then recently published. Before starting he excused himself from playing any real full *forte*, since he had a recital on the next day, and dared not 'tire his hands'. As a matter of fact, it was a most remarkable feat, for he simulated all the required contrasts and details of colouring, while at the same time never exceeding a *mezzo-forte*. Another vivid proof that musical sense does not in the least depend upon noisiness of utterance!

Another author is convinced that actual (real) stiffening is a necessity—the quicker and louder you play, the more stiff must you be! It is asserted that musicians are incapable of understanding or dealing with the 'profound' physiological facts involved in Piano Technique. Even aided by

An
Exploded
Doctrine



the professional physiologist, who might provide correct data, it is, however, clearly possible to draw some quite upside-down conclusions. Thus we find that the claim in favour of stiffness is based on the false assumption that when one repeats a finger rapidly one does so from a fully-raised position. Certainly, if one is so foolish as to attempt to play rapid reiterations of the same finger while using the 'high-stepping action' one will be compelled to play stiffly, because the UP-RAISING muscles of the finger will then refuse to cease their action in time for the DOWN-PULLING muscles to act unimpeded by them. To be sure, there may be some foolish enough to try to use the raised finger here, with its disastrous results, and stupid enough not to recognize the cause of their failure, but the fact is that anyone with a modicum of pianistic talent soon discovers the folly of this, and learns early in life, when rapidly reiterating a finger, *not to lift the finger at all, but to allow the key to do the raising*—learns to allow the key to bring the finger-tip up and back to the surface level of the keyboard. It is merely a case of learning to time the cessation of the finger's down-action accurately enough!

In this case, as there is no UP action whatsoever of the finger, the 'up muscles' cannot possibly come into conflict with the 'down' muscles, and there cannot possibly be any resultant stiffness. Thus the argument in favour of stiffness again falls to the ground. Moreover, it is amusing to find that the very figures quoted from the scientist serve only to confirm my repeated denunciation of the high-stepping finger when there is no time for it.

I find, moreover, that if I wish to repeat the same finger at its quickest and softest I do not even allow the keys to rise to their surface level, but instead repeat the down-action from halfway down in key-descent. The most rapid reiterations can be achieved in this way—some eight or ten per second—which is about the speed limit of mental concentration or cognition. As a matter of fact, there is no speed limit whatever in playing when one uses 'passing-on' touch; for we do not play with one finger only (as some scientists seem to think) but we use all ten fingers! Thus we can play notes at any speed of succession, or actually sound all ten fingers simultaneously.



There is, however, one case where a certain faint trace of stiffness is actually helpful, and that is when playing at the extreme limit of softness. Here the required exertions of the finger are so extremely gentle that they are not easily recognisable.

When
Stiffness
is Permis-
sible

In this case, if we provide a faint contra-exertion of the up-muscles (or stiffness) this resistance, having to be overcome by the down muscles, thus enables us better to feel their exertion. This gossamer-like stiffening gives one much comfort and certainty in such passages—provided, of course, that we are present-minded with regard to key-resistance, and play from the ‘half-way down’ position of the key; or else play *to* the ‘hopper-hump’ only, as I have explained in *The Visible and Invisible*, page 8. So there is a place for everything, even for Stiffness! But, excepting for the aforesaid purpose, the more freely you do your work, the more musical will be your playing throughout*

There is a form of slight stiffness we cannot avoid, however much we would, for there is a point beyond which we cannot relax our muscles—a slight residue of tension remains always. Some call it the ‘tonicity’ of the muscles. This condition, although it has nothing to do with pedagogics (since we cannot alter it) is interesting to note. Its degree undoubtedly varies with different individuals; with some it seems to be more pronounced than with others. I believe that so-called ‘Piano talent’ includes a gift of greater freedom from its incidence than in the case of those who find themselves more or less unfit for any delicate gymnastic pursuit. In fact, I believe, that this condition of *tension-residue* varies from hour to hour, and accounts largely for those great *changes* in technical comfort we all of us experience from hour to hour. One day we feel we ‘can do anything and everything’ both musically and technically, while on another day everything seems dull, difficult and clumsy. Musical alertness and technical freedom certainly seem to go hand in hand, and Body and Mind, it is manifest, always react on each other.

Tonicity
of the
Muscles

So finally we realise the importance of seeing to it that we

* Some artists find that a certain stiffness helps them to sense the *musical* continuities. There is no harm in such *superimposition* on the real playing act—where the artist is sure of his basic playing processes.

must be in good health if we wish to play our best—and with the greatest possible freedom from . . . STIFFNESS.

NUMBER THREE

WEIGHT-TOUCH AND SINGING TONE

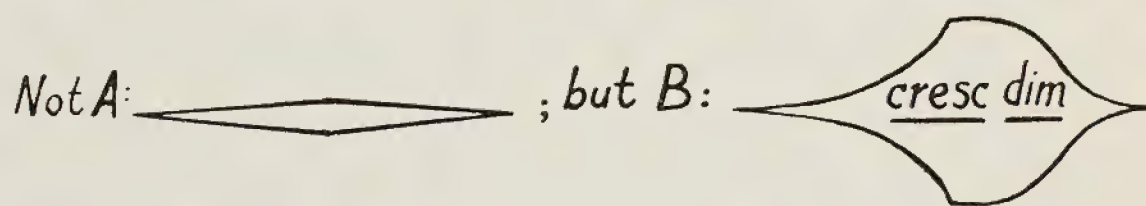
A GOOD deal of vagueness and misconception also seems lately to have gathered around the term 'Weight-touch'. It would therefore seem desirable to try to dissipate this fog. Strictly speaking, there is no such thing as Weight-touch! It has quite wrongly been assumed, that by Weight-touch is meant that the tone is produced by the lapse of weight *without* the intervention of finger and hand exertion! Nothing is further from the truth. 'Weight-touch' is a convenient term in Piano Pedagogics; for if you allow the weight of the arm to be set free during the moment of key-depression it certainly *feels* AS IF the tone were produced by 'lapse of weight'. But it is not, since the free-set weight only serves as a momentary BASIS for the exertion of finger and hand against the descending key. Yet it is easy to see how confusion of mind has arisen in consequence of this sensation in producing singing tones and chords. I had fondly imagined that all this had been made clear in my very first book on Technique some thirty-five years ago*; yet it is evident that many do not take the trouble to read what has been written to help them in their work, and even believe that they cannot be helped by the written word. Certainly, obedience to the laws of Art cannot directly produce an artist, but you cannot become an artist unless you do pay strict obedience to such laws—as HERBERT SPENCER has so well said in his *Education*, a little book that is full of weighty words.

No, tone is not produced by mere lapse of weight. Even in those first steps at the Piano, where I recommend that the fist placed sideways upon two black keys is allowed to take them down by release of arm weight—even here, strictly speaking, the tone is not 'produced' by weight; for unless the sideways-used hand is sufficiently exerted downwards, the wrist joint will drop in!† Weight never produces the

* *The Act of Touch*, 1903.

† See *Child's First Steps* and *First Solo Book*, etc.

tone, it only acts as a basis for the finger-hand actions. This I try to make clear at my lectures on Technique, by dropping a pencil and a poker simultaneously. The class always imagines that the bigger weight will reach the ground first, but it does not, for the two reach the ground at the same moment. They move at the same rate because every particle of matter is attracted to the centre of the earth with equal force, whether moving in a large mass or a small one. Try the effect of a four-ounce or a two-pound weight allowed to slide a key down, and you will find they give practically the same tone amount. True, there is a slight difference in effect between the two, owing to the key-FRICTION being more easily overcome by the bigger weight; but it is only slight in comparison with the difference in weight, and the tone is of a nasty 'tubby' quality. To produce good and controlled singing tone the ultimate secret is that the motion of key-descent must always be *livingly* directed; and this, because the motion of key-descent, to be tonally effective in singing touch, must always be increased *during* key-descent—in fact, there must be an acceleration of speed at 'increasing ratio', just as it must be in every other form of speed-production, and tone and time inflection. For instance, one does not play a *crescendo* as notated in the text, but in geometrical progression:



From "The Visible and Invisible" by permission of the Oxford University Press.

There is, however, no limit to the mistakes some musicians make when faced with those very simple physical and physiological facts concerned in the act of performance. Thus the question seems recently to have arisen *whether* one should use arm-weight for singing tone, or *whether* one should use 'Muscular-exertion' instead of it! This is just as futile as it would be solemnly to debate whether or not the weight of our body is or is not borne by our legs and feet in walking!

If you sit on a high stool and dangle your legs in the air, then your feet certainly are free of body-weight—and your sitting-apparatus gets the full brunt of it! But the moment



you press your feet against the floor, that moment reaction upwards at once brings your body-weight to bear upon the floor, precisely in the measure that you press the floor with your feet.

Just so at the Piano: arm-force cannot possibly reach the keyboard so long as your arms remain in a fully 'self-supported' state, and provided you make no exertion of the finger and hand; for your arm-weight 'sits' upon the arm up-muscles supported by them; but the moment you EXERT your finger and hand downwards against the keys, that moment—by reaction again (in this case upwards against the wrist)—the *inertia* of your arm-weight becomes the basis for your finger and hand action; and to the extent that you exert them, the weight of the arm is levered upon the keys, whether you release the arm or not at that moment*. So it is impossible to get away from arm-weight in singing tone. Indeed, you may release the arm during the moment of key-descent, and thus *compel* fingers and hand to do their work, and it is this combination (of arm-release and finger-and-hand exertion) which is called 'Weight-touch'—and nothing else is Weight-touch. In true Weight-touch, therefore, the elbow tends to fall back for each note; and when it does not feel like that, then you are not really using the free-set weight of the upper-arm with its rich quality of tone, but are instead using the muscular-exertions against a self-supported arm with its thinner tone. Hence it is clear that there can be no singing tone without the participation *both* of Weight and Muscular-exertion, and the question 'whether' one *or* the other should be used is therefore quite

* If the arm is released it forms a more solid and stable basis than when it is elastically supported by its muscles. But an elastic basis is quite a good one, in spite of any stupid quibbling to the contrary! And the arm when brought into vibration during arm-vibration touch, forms just as good a 'basis' as does my stationary car, vibrating in response to its engine.

The following experiment may here prove helpful: Allow your *right* arm and hand to lie flat on a table, then let your left arm at its wrist-joint rest sideways upon the knuckles of your right hand. Now press the fingers of your right hand down upon the table, and by reaction at the knuckles they are bound to lift up against the weight of the left arm. But now, instead of this, let the left arm be fully self-supported by its own muscles, while still touching the right-hand knuckles, and again press the right-hand fingers down upon the table, and it is found that they again lift up against the weight of the left arm, and this in spite of the fact that it is in its 'floating' condition. Thus arm-weight is always in evidence, whether momentarily relaxed or not.

fatuous. Manifestly, we cannot get away from the agency of Weight in singing touch, whether we use the relaxed arm or the self-supported arm. It is just as absurd to claim that one can, for singing tone, use 'muscular exertion' *without* the basis either of arm-inertia or weight-release as it is to pretend that the use of relaxed weight implies the *omission* of finger- and hand-exertions.

There is, however, a point which may have caused confusion of mind. In using Weight-touch we can think of it in two ways; we can either:—

(1) Directly prompt the required arm-lapse and allow finger and hand to act in response; or

(2) We can directly prompt the required finger- and hand-exertion and allow arm-lapse to ensue in response.

It is a matter of personal bias, and of ear for the particular tonal effect desired, just as it is whether one chooses to make one's singing *key-acceleration* either (a) against a more or less fully self-supported arm, or (b) make it against a momentarily relaxed arm. Undoubtedly, this latter method is the better to ensure ease, volume, good quality, and also nicety of tone-inflexion from note to note, as needed in *cantandos* and *cantabiles* moving at the slower tempi. But the first unfortunately becomes necessary at quicker tempi, either with separate hand exertions behind each finger (so-called 'individualized' finger touch) or else as 'passing-on' or 'weight-transfer' touch. This, however, always has the drawback (when applied for high-speed 'finger' passages) that tonal individualization from note to note becomes jeopardized or completely wiped out, and the playing consequently at once becomes less like real Music-making*. But whichever form of touch is used the ultimate basis of arm-weight is ever present, and no theories can possibly eradicate it.

Strangely enough, it is this whole-arm release (accurately gauged) which we must employ for chords and single notes *at their softest*. Bear this in mind when you find yourself failing to sound such at their softest. Here it is well to repeat that the use of the arm in playing resolves itself into six main ways:—

(1) Weight-release of the whole arm, during the moment

* In velocity passages, only mass-production *crescendo* and *diminuendo* effects remain possible.



of tone-production. Or sometimes, in addition, an actual pull backwards of the Upper-arm, or Elbow.

(2) Weight-release of the Forearm only during the moment of tone-production.

(3) Down-exertion of the Forearm in conjunction with fully relaxed upper-arm during the moment of tone-production—for extreme *fortes*.

(4) A poke forward of the upper-arm in conjunction with the down-exerted Forearm during the moment of tone-production*.

(5) The continuous fully (or sometimes partially) self-supported whole arm.

(6) The Forearm Rotatory Element, which inevitably applies to every note played, whether we try to use the clumsy upper-arm rotation or not.

But there is no limit to the folly of some musicians! In my young days, we were always adjured 'never' to use the arm! One of my teachers was very strong on this point; but what he really objected to was arm-MOVEMENT, since he, himself, had a really fine singing tone (which I tried to copy), and therefore correctly produced it with the help of individually-applied arm-releases. In fact, in those days, we had the KALKBRENNER Wrist-support, invented for the very purpose of preventing the use of arm-weight! Also, it was supposed to teach one to keep the arm 'off' in running passages.

It consisted of a mahogany rod supported just above and in front of the keyboard; the arm, at the wrist was supported on this rod, and it thus prevented the arm from pressing down upon the hand and fingers. But, of course, it lamentably failed in its well-meant but foolish purpose. While, for the time, it prevented the arm from forcing down upon the poor hand and fingers, it did not in the least help one to learn to keep the arm *off* them, since one was not learning to exert the required up-muscles of the arm. Moreover, it still allowed one to lift upwards with the fingers and hand against that mahogany-supported arm; whereas one should be learning to avoid such up-pressure—for agility passages, etc.

The problem always is, to teach our brain to guide our

* This, if used for *fortes*, produces that tubby or harsh tone, which so often disfigures the playing of some otherwise quite fine artists; and it is a common fault with beginners, unless at once checked.

actions, therefore can no machine ever help us; any more than can our automatic centres supplant the required rhythmically-guided Purpose in our Music-making. However correctly we may supply the requisite arm-weight and muscular-exertions, they will not produce the wished-for singing tone, unless we, in the meantime, for each note, properly time its due measure of key-acceleration; the due KEY-ACCELERATION AT INCREASING RATIO!*

NUMBER FOUR

FINGER OR AGILITY TECHNIQUE

AGILITY can be acquired by anyone who thinks it worth while and will take the trouble. Yet more pedagogic crimes have been committed in the past under the guise of teaching 'Finger-individualization' than in any other way; and the ways have been many and sad—both for Music and the martyrs!

These misconceptions have mainly arisen from the ever-futile attempt to diagnose Technique by means of the eye, whereas the eye gives but little indication of the necessary acts (mostly invisible) implied in the process of using the Pianoforte key, although the ultimate rationale of Agility technique is quite simple, and depends solely on obedience to a few simple laws. Because certain artists have adopted various fads of movement and position, it was assumed that these formed the secret of their success. Thus arose the 'methods' of exaggerated high or low wrists, or knuckles pressed in, or highly raised, or highly hooked fingers—so that one should better be able to *hit* the keys down—that 'little hammerette' action which proved such a misery to so many would-be learners—who consequently never succeeded in anything but in wrecking their fingers and arms. Think of the leagues of unmusical and quite unnecessary exercises compiled with the idiotic purpose of 'strengthening' the fingers, while all the time it was ignorance of the correct conditions that produced the seeming effect of 'weak' fingers!

CHARLES DARWIN was an inveterate experimenter. When

* The experiments of the American Steel Institute fully corroborate this teaching.



his first two children were born, he put into their wee hands a stick—which they at once gripped hold of, and he was able to raise them while they clung to it! Their fingers, newly born, were strong enough to support the weight of their bodies—surely strong enough therefore to sound a Piano key!

Strength of tone does not so much depend on a large outlay of force as upon the way we manage the key and our muscular-apparatus. Certainly, it cannot be gainsaid that if one is born with a large 'Piano voice' one does find many things easier all round. But it does not guarantee a great artist, and the expression of musical feeling does not at all depend on noisiness of utterance—which seems to be the ideal of many an unsuccessful player.

Agility technique obviously is a *sine qua non* for the Piano player, since the inclusion of rapidly succeeding notes hides in a measure the lack of any real sustaining power of our instrument; hence all the great masters (and even small masters) of Piano and Harpsichord music have found themselves compelled to use this device. At other times, however, the rhythmically effective Percussiveness of the Pianoforte (above all other instruments) is a great asset in its favour*.

* What a pity that so few of our present-day composers make any attempt to write true Piano music! Is it sheer laziness? Instead of flowing melodic and rhythmic passage-work they stalk along sounding solid chords, and rely mostly on harmonic strangeness (in combination and succession) to arouse attention and interest; consequently, their supposed Piano music is passed by with a momentary shocked smile. Granted that in some cases such naughty-childishnesses are forgivable when they are accompanied with strong rhythmical fervour; but music relying mostly on harmonic interest soon fades. On the Piano mere chord-successions form but a weak imitation of the sustained sounds of an Orchestra or string or voice combination, and to rely on such even in a Concerto shows a complete lack of tonal imagination, and only makes our instrument sound foolish. Certainly, the province of chord effects is in strongly rhythmical music, and here this very percussiveness of our instrument stands us in good stead, and cannot be equalled by any other. Probably it is one of the main reasons why our instrument is held in such great esteem. Can any orchestra compete rhythmically with the Pianoforte—for instance, in the first and last movements of Schumann's Carnival? Musical interest probably ranks in the following order of pre-eminence: (1) *Rhythmical* interest, in its large and small shapes; (2) *Melodic* interest, both in its slower and quicker manifestations; (3) *Contrapuntal* interest—but that needs an expert writer! And frequently, at the end of the list: (4) *Harmonic* interest, both vertical and horizontal. Yet, in the end, none of these Interest-building devices are in the least convincing, unless used for the direct expression of Mood or Feeling—direct Self-expression.

Agility, the free, easy and quick transit across the keyboard, is acquired by a process of elimination, as in the case of every other acquired dexterity—by elimination of all and every impedimental action. Thus, if, instead of the required self-supported condition (elastic poise) of the arm, you force it down upon your fingers and hands, you inevitably stop your progress across the keyboard—you 'stop the traffic!' The same thing happens when you jam your hand continuously down upon your fingers (as every beginner does) or when you jam your fingers upon the *key-beds* (and up against your arm by reaction through the hand) and thus prevent individual help reaching each successive finger from hand and forearm. This will certainly happen unless the individual exertion of each finger (along with the hand behind it) is accurately 'aimed', that is, timed to each sound, and not upon the floor through the key-beds*.

Why, then, at the Piano apply any impedimental action or 'tension' that prevents your journeying easily? Why allow yourself to be stiff all over (through antagonistic muscular action), instead of applying only the needed effort? Why try to make tone when the key is down? Why make Forearm rotatory exertions in the contradictory direction? Why fail to pay attention to the lever-machine under your fingers, when musical-effect is entirely dependent on such Key-sense and rhythmical *presence of mind*?

The main laws conditioning Agility-technique (whether for so-called Finger passages or double notes or octave passages) may be summed up under the following eight main headings:—

(1) ACCURACY IN AIMING THE TONE-PRODUCTION EFFORT FOR EACH NOTE—always as short lived as for *Staccatissimo*, else our efforts are misapplied and wasted on the key-beds†.

* Once, in my early motoring days, I drove to the next town, some ten miles off, and wondered why the car was going so badly. When I reached my destination I found the brake-drums red-hot and the brakes smoking! I had partially left the hand-brake on all the time! What a waste of good energy and petrol!

† Here it is well to note that we possess 'small' and 'big' finger-muscles—respectively on the hand and arm. At the Pianoforte we must usually employ *both* to sound the notes, but the small ones suffice to hold the notes down. See p. 23, etc., 'The Visible and Invisible.' To acquire the (here) requisite discrimination one of the most useful exercises is the 'sustained-notes' exercise when correctly practised as directed in my 'Relaxation Studies,' page 107.



(2) ARM 'OFF'—THE SELF-SUPPORTED ARM—so that it does not unduly bear down upon hand and fingers, and thus stifle all accuracy in such 'aiming'.

(3) INDIVIDUALIZED HAND EXERTION—EXCEPT IN PASSING-ON OR WEIGHT-TRANSFER TOUCH—else there can be no 'individualized finger'.

(4) FOREARM-ROTATION, AND ITS CORRECT INCIDENCE FOR EVERY NOTE—without this there can be no ease or evenness in passage-work.

(5) FREEDOM FROM ALL ANTAGONISTIC (DEFEATING) EXERTIONS—freedom from stiffening, either finger, hand or arm.

(6) RECOGNITION OF THE NATURE OF THE KEY-MECHANISM—so that we may not try to make our tones too late in Key descent.

(7) RECOGNITION OF KEY RESISTANCE—the necessity of key sense so that our choice of force for each note may be musically correct.

(8) FREEDOM OF THE HAND AND WRIST HORIZONTALLY—so that the various fingering positions may be neatly joined up.

This problem of the so-called 'individualized finger' (which has quite rightly been the aim of so many teachers of the past) is therefore not solved (as it was supposed to be) by trying to give separate finger actions, but by our supplying the correct and helpful and accurately-timed exertions of finger alone, or of *both* hand and finger, and the correct arm conditions involved—although mostly invisible.

From all this it might appear at first sight that one has only to note the incidence of these laws, and 'hey presto', perfect Agility is instantly achieved! Unfortunately, things are not quite so delightfully simple. True, if you have brains, you can by will-power instantaneously do the right things in spite of old faults or shortcomings; but unfortunately, to be available for music-making, these corrections must first be formed into habits! Now this can only be achieved *by hard work*—correctly carried out on these lines. Moreover, even when such habit-making has been achieved, there is still no respite for lazybodies; for the act of *aiming* and the act of *key attention* (although maybe prompted by habit) yet for ever demands an act of Volition. That is, the act of aiming,

being a rhythmical act, for ever needs perfect presence of mind; and likewise, the sense of key-resistance can only be achieved by such closely timed attention*.

The Frustration of Agility and Finger-individualization in the past (and present, too) has mostly arisen from non-obedience to and ignorance of the *first two* laws enunciated above. It has not been recognized that the effort of tone production must *never be longer-lived* than during the production of *staccato*†—whether or not we add the holding down of the keys for *legato*; and that such accuracy in tone-production cannot be attained if the arm is jammed down upon the fingers and hand. Indeed, we cannot play passages musically *without attention to the key itself*, neither can we, if we really hit the key down without a vivifying ‘follow-on’ action for each note; neither will our passage-work be even, unless the forearm invisible rotatory changes and repetitions are in sympathy with each finger. And we certainly cannot achieve mastery in any respect if we allow defeating exertions (stiffness) to impede us in our efforts.

The folly of stiffening has already been referred to in previous articles, but the fact that in brilliant agility passages, the floating, poised, self-supported arm is set into vibration by the rapidly recurring reactions against it from the finger and hand, has lately been exploited as an argument in favour of stiffening the arm itself in such passages. It is mistakenly assumed that the floating, vibratile arm ‘cannot serve as a basis’, on the ground that a basis must be immobile. But this is again making a fool of Science, by drawing wrong conclusions from her facts. When you throw a ball by arm-movement the home or foundation or ‘basis’ for the throw is certainly at the shoulder—in the first place. And this basis remains a basis, though it may be in movement when you run while throwing that ball. An aeroplane engine affords many examples of such ‘bases’ during the action of its engine—and we are compelled to continue calling them such even when the machine is travelling 200 miles an hour! All of

* Here it is, that we pianists find ourselves to be the very slaves of our instrument! For we cannot keep in Concert-form (or even in mere playing-form as a teacher) without unremitting practice! Once we have learnt how to use the instrument we can never really forget this, and we may take a holiday at times, but the slave-driver is always behind us!

† It would hence appear that so-called ‘Finger-talent’ is mainly a *rhythmical* talent!



us successful pianists, therefore, flatly refuse to be misled by any quibbling on the interpretation of a scientific term; and we shall all continue to use our carefully poised arm (although in a vibratile state) since it offers us such a splendidly effective, comfortable and admirable foundation or point of stability or basis for the operations of our fingers and hands in Agility passages. No doubt such poised-arm basis has served its purpose for ages past, although the few geniuses who in the past happened to hit upon the device, probably had no inkling of the secret of their successful Agility. Certainly, it would be folly to discard it in favour of a stiffly held (muscularly antagonistic) arm at the mistaken behests of what must be termed pseudo-science*!

Moreover, it should be noted, that these rapidly recurrent vibrations of the forearm are necessarily in accurate time with the short-lived exertions of the finger-and-hand causing them, and it is probably the rebound of each up-vibration that helps the successive fingers so effectively†.

It should also be noted that for somewhat louder Agility-passages, the arm (when desirable) may be allowed to lie lightly on the hand (the arm here being in a slightly *less* than fully-supported state) and this slight extra weight, thus resting upon the hand and fingers, in this case helps to thicken the tone in such passages. Care must however be

* By the way, it must be understood that it is not the arm 'that vibrates the fingers', as I fear BREITHAUPT (the inventor of the term 'arm-vibration touch') evidently supposed, but that it is the reaction of the finger and hand that provokes that slight vibratory state of the forearm.

It has been quite falsely asserted that I have said that ALL Agility-work must necessarily be arm-vibration! Whereas what I have said is that all *musical* agility-passages need finger-individualization—every note personally meant, and not smeared over as in Weight-transfer touch. Hence the arm must needs be 'self-supported' (no, not at all 'fixated' as some would have it) and, at speed, a vibrational state of the arm *may* ensue, and quite beneficially. But the inertia of the self-supported arm also offers sufficient basis, without *necessarily* coming into vibration.

Now, as there is a speed-limit to the use of separate arm-lapses for each note in singing-touches, so does arm-vibration touch become impossible beyond a certain limit; and then we are compelled to revert and resort to Weight-transfer (or 'Passing-on') touch, with its mass-production effects and disadvantages, and musically un-individualized sounds.

† I suppose to be fully 'scientific' one should describe the action as having the vibratile forearm at the wrist as its *first* basis or resistance, thus recurring to the elbow as a *second* basis, and the shoulder as a *third*, and finally the body down to the hips as a final one! But does such quibbling in the least help the student?

exercised, so that the weight is not allowed to become great enough to press down solidly upon the key-beds, else inevitably it will deleteriously affect our *tempo*—our Agility power—see p. 92, *The Visible and Invisible*.

Agility, again, is often ruined by disobedience to the incidence of Forearm rotation with each finger used—both when the implied exertions and relaxations are visible and when they are invisible. This is, however, so important a subject, darkened as it is by ancient and present-day fallacies, that it is best to defer its consideration till the next article.

NUMBER FIVE

FOREARM ROTATION

AGILITY, as I pointed out in my last article, is often ruined by lack of attention to the incidence of Forearm-rotation, i.e. 'pronation and supination' of the forearm; for unless the direction of rotational help for each finger is correctly adjusted, this will certainly again 'stop the traffic'; and without such help we cannot even turn the hand over into its playing position, nor keep it there*. Perhaps this subject needs more clarifying than any other, seeing how much misunderstanding has collected around it. The required rotary actions and inactions are mostly invisible, hence, as the teachers of the past relied solely on eye-evidence, they failed to discover any glimmering of its true importance. All that was realized was that with certain tremolos or shakes actual 'rolling' or rotatory movements were discerned, and were applauded as they were found helpful†. Every would-be player in the past, however, came under the sway of its laws although unaware of them. Many, indeed, are the finely-effective rotation studies written at the time, by CZERNY, for instance, in his Op. 740 (*Fingerfertigkeit*), and it is evident that he, for one, was fully aware of the necessity for forearm-rotatory freedom, although he formulated nothing about it.

* We use strong muscles to turn the hand over towards the thumb, but we use only weak muscles to keep it in position.

† I remember being much intrigued (when I was about fourteen) seeing my then professor, WILLIAM DORRELL, play his shakes by forearm rotatory movements; but he had no explanation to offer and, I fear, was rather nettled by my calling attention to the phenomenon!



CHOPIN, again, with his exquisite pianistic sensitiveness, is found constantly relying upon rotatory freedom in his ever-melodic passage work; and it is for this reason that many of his studies prove so helpful to the advanced player—quite apart from their supreme musical value.

Forearm-rotation is at the root of that question which always (and quite rightly) so agitated the teachers of the past—that ever-sought-for ‘Equalization of the fingers’. Hence the compilation of endless volumes of *Techniques and Studies*, all with the purpose of ‘strengthening and equalizing’ the fingers. Some lucky geniuses certainly did happen to tumble upon the right ways of playing even by that process, although many others succumbed musically and physically*.

All this former work in the dark is now obliterated. Understand, and learn correctly to apply the forearm rotatory impulses, and at once every finger is equally ‘strong’ so far as the keyboard is concerned. That is: we can then apply force equally with all the fingers, there are no longer any ‘weak fourth and fifth fingers’; and we see why the thumb, which at the Piano is really the weakest finger (since it has to be applied sideways) came to be regarded as the strongest—because forearm rotatory help always naturally fell to its portion!

The direction in which this ever-needed rotary help is needed by each finger (and usually quite invisibly) is always in the direction *from* the last-used finger and *towards* the one next to be used; unless the same finger is repeated, when, of course, the repetition rotarily is identical in direction—and this applies for passages in *of Rotation* double-notes and octaves. This rule is quite without exception; it applies even in the case of turning a finger over the thumb. For instance, any finger when passed over the thumb is helped by rotation towards the *little*-finger side of the hand, and *not* towards the thumb, as the unwary might imagine. Lack of understanding of this

* This does not mean that I advocate the total abolition of all study and technic practice. Everything in its right place and perspective! A certain amount of time spent on *Technics and Studies* is, in fact, most desirable, but they must be practised only and solely with the clear purpose in view of applying and enduring into habit the now known correct conditions, muscularly and rhythmically, which alone make for technical and musical Ease and Mastery.

fact is the cause of all that unevenness of scale and arpeggio playing one finds in the case of those badly trained in this respect*.

Here again the Doctrine of Defeatism would try to step in, and persuade us to believe in the two following manifest fallacies on this point:—

(1) That the direction of the rotational stress is *in the opposite direction* when applied INVISIBLY to what it is when applied VISIBLY! This is just as untrue as it would be to maintain that the preliminary, *invisible* exertion when trying to turn a stiff door-handle should be in the opposite direction to the required one—as shown when the actual movement occurs! This fallacy (that the direction of rotation when invisible is in the opposite direction from that when it is visible) may be the outcome of the obsession that when movements do not appear, this implies that they are PREVENTED from thus appearing by the use of antagonistic defeating exertions! Nothing, however, is further from the truth. For instance, to sound notes we are compelled to use both finger and hand exertions in conjunction with this rotational stress each time, but which of these three Elements is made to disclose itself in actual Movement is simply and purely a matter of TIMING and balance of power. Thus:—

ROTATION IS VISIBLE when the rotational impulse is applied FIRST and exertions of hand and finger are only added during the moment of key-descent.

ROTATION IS INVISIBLE when the hand and finger are exerted FIRST, and the rotational impulse added only during the moment of key-descent.

In the first case there is a predominance of Rotation.

In the second case a predominance of finger-and-hand exertion.

Again the difference between finger, hand and arm movements is, similarly, solely a question of *Timing* and power in favour of one of these three elements. The non-moving

* 'The proof of the pudding is in the eating.' Artists sometimes come for advice, finding a certain passage 'difficult, which other players seem to play with such ease'. This often resolves itself into the fact that they have not learnt to recognize the incidence of invisible rotation. Fear of the passage has led them to use antagonistic 'tension' just as recommended by some. After some ten minutes of explanation the 'difficulty' has at once and for ever vanished. The direction of rotation having been made clear, all rotational stiffness, which was the cause of their trouble, is forthwith discarded and the player goes his way rejoicing!



portions of a limb in both cases are certainly not FRUSTRATED from moving; they are simply left quiescent until needed. In good playing there is no 'tension' in the sense of stiffening-up, or muscle-binding whatever; it is only the inexpert and bad players who exhibit such Defeatism—until they learn better! Therefore, also, when learning to apply rotation, it is indeed perfectly correct and helpful at first to practise *with actual rotational movements*, so as to make sure of their correct incidence in every passage, before we subsequently pre-time the finger and hand actions, and are then said to play by 'finger-touch' or 'hand-touch'.

(2) As to 'The Axis of Rotation', here pseudo-science completely comes to grief. To begin with, there is the total misapprehension that the middle finger must necessarily be the centre or *axis* of rotation; although, with complete inconsistency we are afterwards told that it may also be somewhere between the fourth and fifth fingers! Whereas, the truth is that *any* of the five fingers can and do serve in that capacity*.

How ridiculous is the folly of imagining that the middle finger must necessarily form the sole axis of rotation becomes abundantly clear the moment we realize the true nature of forearm rotation, as follows:—

As a matter of fact, there is no such thing as forearm rotation at all in the sense that the whole forearm runs round on itself, like a wheel on its axle. Instead, we have one of those marvellous cases of adaptation of which there are so many examples in the human body, and which sometimes make one almost doubt the doctrine of Evolution by Natural Selection! If we had had only *one* pivot at the elbow upon which to rotate, this would have greatly restricted our hand movements; so instead, we find a marvellous engineering feat, for we have *two* side-by-side forearm bones socketed at the two sides of the elbow and at the two sides of the wrist; the one socketed at the thumb side is called the *Radius*, while the one socketed at the little finger side is

* True, if you hold your arm out in front of you, and rotate your hand to and fro, you will naturally choose the middle finger as the centre of movement—or rather, the tip of the *bent* middle finger, and the centre of the wrist-joint; but the case is quite different when you lower your hand upon the keyboard, each finger-tip in turn then becomes the pivot of rotation.

called the *Ulna*. Now it is the turning of these bones upon each other that gives us our remarkable freedom of hand and forearm rotative movements, and which have so much helped the progress of our race. It has been generally assumed that in turning the hand over towards the thumb it is the *radius* which is twisted upon its brother, the *ulna*; and this idea has been fostered by the anatomists. This is indeed true, yet it is not the whole truth. Certainly, we can thus rotate the wrist-end of the *radius* (with the hand) upon the *ulna*, while this latter remains stationary, but it seems to have been quite overlooked that the *ulna* also can swing round (with the little-finger side of the hand) while the *radius* in turn remains stationary! In other words, while the *radius* at its wrist-end can turn *over* the stationary *ulna*, so can the *ulna* turn *under* the stationary *radius*. It is the possibility of this compound movement that enables us to rotate with *any* of the fingers as 'apparent axis', and with the key (at surface or depressed level) as fulcrum; and it is thus that we are enabled to play our passages evenly. This, of course, quite completely explodes the fallacious notion that we can use only the middle finger as an 'axis', with its incredibly stupid concomitant, that when we use the index finger after the thumb we must rotate again towards the thumb, and when we play the ring finger after the fifth finger then we must repeat the rotation towards the fifth finger—propositions so unthinkable as almost to lead to Pianistic insanity!*

To render these facts clearer, try the following two experiments: (1) Let your arm lie on a table with the hand resting sideways on its fifth-finger side, now roll the hand over until the thumb touches the table, and let it roll back again. Here you are twisting and untwisting the *radius* over the *ulna*. Now, instead, rest on the thumb-side of hand (with hand level) and then roll the fifth-finger side of your hand *up* from the table (upon the thumb) and let it fall again; here you are circling with the *ulna* itself—but it cannot rise far from the table. (2) Hold your forearm straight out in front

* In proof of this, try to execute a shake with thumb and index finger in this absurd way, with rotatory *reiterations* towards the thumb; or between the 4th and 5th fingers with rotations each time towards the little finger; and then repeat the two shakes with rotatory *alternations*—the only sane way! Even a dog knows better! When shaking himself he gives *alternate* rotational jerks with his body—beginning with his head and ending with his tail!



of you, now rotate each one of the finger-tips of this hand in turn upon the other hand, held out sideways and at right angles to it; and you will find that you can 'rotate' your hand equally well upon any of these five fingers, thanks to the explained double action of these two forearm bones. This, in fact, is the process used at the Piano by every successful technician—each key in passage-work in turn becomes the fulcrum for rotation—visibly or invisibly. This last experiment also again proves how thoroughly *unscientific* is the notion that 'only the middle finger' can serve as axis of rotation, and how amply justified is my rule—that rotation (whether visible or not) is always in direction towards the finger to be used.

More amazing still is the suggestion that one should not use forearm rotation at all in playing, but should instead substitute a rotation of the upper-arm!

<i>Upper-arm</i>	This suggestion, however, cannot do much harm, seeing that it is far too difficult and discouraging to try to carry into practice, since upper-arm rotation is always clumsy and sluggish compared with the easy and agile forearm rotation element.
<i>Rotation v. Forearm Rotation</i>	

If applied, it will certainly prove 'subversive of good Technique'. True, we can bring the hand into playing position by twisting the upper-arm in its shoulder socket, but we cannot do so without sticking the elbow out sideways each time—a circling movement of the elbow which LISZT decried as 'making omelette'. But the fullest confutation of this particular fallacy lies in the fact, that it is QUITE IMPOSSIBLE to transmit any force whatever from the upper-arm rotationally to help the finger, *without* the intervention also of this decried forearm rotation itself; since the two forearm bones intervene between the upper-arm and hand, and their mobility cannot be ignored!

So we shall placidly continue to use our so comfortable forearm rotation actions and relaxations, and shall refrain from using upper-arm rotation, except when applied to its right purposes.

Thus, for instance, for those apparently simple little side-way (horizontal) movements of the hand and forearm when taking small skips within the two-octave compass—with elbow stationary, here we do need upper-arm rotation to

help us. For this apparently so simple action is really triplex. It is a triple compound action embracing:—

(1) *Upper-arm rotation*—to create the sideways movements of the forearm.

(2) An alternate *lowering and raising of the forearm* itself—so as to keep the arm level with the keyboard (since upper-arm rotation, alone, would alternately raise and lower the forearm); and finally,

(3) *Alternate rotations* of the forearm itself—so that the hand may remain level, with knuckles up during the process! (See pp. 82-83, 'The Visible and Invisible.') But it needed a musician to point this out to the anatomists!*

It is perhaps a pity that the term 'forearm rotation' was adopted in this country, but it has probably been in general use for centuries; indeed, before a keyboard was ever dreamed of. Certainly, no bow was ever pressed upon the strings of a Violin or 'Cello without the intervention of *invisible* forearm rotation—either applied freely or else stiffly with its scratchy results! So I fear the term cannot now be dislodged. The German term, 'Unterarmrollung' (forearm rolling), might otherwise have proved more suggestive at the Piano.

To sum up: See that you use forearm rotation always *in the correct direction* for each finger, and always perfectly *freely*, whether visibly or invisibly, and you will be spared much technical misery. True, those who are endowed with strong muscles can manage to hit their way through technically (up to a point) in spite of much pianistic wrongdoing—'fixation', 'antagonistic tensions' and all! But why play with difficulty when musical self-expression is so much easier when we use our limbs freely? It reminds me of HANS VON BÜLOW's congratulations to a lady amateur, who had played execrably at a party: 'My dear Madam,' he said, 'really, never, never in my life have I heard anyone play so

* This reminds me of an amusing piece of leger-de-main which one of my former colleagues used on the unwary. He would swing his arm up from his side, shoulder high, with his hand position seemingly unchanged (with knuckles up), then he would swing his whole arm forward straight in front of him, and ejaculate: 'There, you see, my hand is in playing position, so all this forearm rotation business is bosh!' And the unwary would feel dumbfounded and cornered; for they had not noticed (since his elbow was hidden in his coat-sleeve) that he twisted his elbow round (inwards) during the process of raising the arm, and had thus turned his hand into its level playing position!



difficultly as you!' But the lady took it as a compliment!
'The next and final article of this series will deal with 'Key-sense v. Key-hitting.'

NUMBER SIX

KEY-SENSE v. KEY-HITTING

COMING now to the matter of key-consciousness, here we find ourselves face to face with one of the basic technical distinctions between the artistic and inartistic use of our instrument. Probably it is the most radical and far-reaching of all, and insistence on its application is, I feel, perhaps the most important and beneficial of all my own technical teachings. When a player of average ability, who has so far not discovered this sense, is shown its application, the result is a veritable transformation musically. From seeming to be musically dull, his playing is at once transfigured, and he seems to become alive and endowed with musical sensitiveness—which before had remained unexpressed. The musical difference between the player who has thus learnt to sense the key and the player who still 'strikes the key' is as great as the difference between day and night; and it thus forms the main difference between musicality and unmusicality of utterance; thus giving us positive proof of the imperative necessity of using this invaluable sense.

What, then, does it imply? In brief, it may be described as *awareness* of how one touches the key and how one moves it. One becomes conscious of touching the key-surface by one's tactile sense (sense of contact) but one can only feel how much force to apply, through the sensation derived from our muscular sense—of work being done*.

Yet this sense is nothing new or apart from our daily activities; we use it all day long. When we pick up a glass or cup of water, we don't hit it, we come upon it gently, we feel the contact, and we then adjust our raising action according to what we feel there. No doubt, when we start life, we begin by hitting the glass or cup, and with disastrous results, but we soon learn better—no doubt a good spanking may have hastened matters! We always provide our muscu-

* See *The Visible and Invisible*, p. 12, and *Act of Touch*, p. 112.



lar actions in response to what we feel to be necessary*.

Yet it has lately been boldly asserted, in quasi-scientific words, that key-consciousness is 'impossible and absurd'! This is another of those false deductions made from scientific facts. It is argued that the *tempo* of nerve-transmission is too slow and sluggish to admit of any messages between finger-tip and spine (or brain) during the act of touch. Clearly, this fallacy has arisen on the supposition that the keys *are hit down*. Now, if we are so foolish as to use unmitigated hit-touch (euphemistically 'Percussion touch'), then there certainly is no time for any to-and-fro messages from finger-tip to spine and back, and we should certainly have to rely on memory of previous experiences of key down-hitting, and our playing would depend mainly on guess-work. Yet the fact is that a good player never really hits the keys down, however much it may look like that. On the contrary, he always comes upon the key gently, or with a blow not hard enough to move the key, and then *follows on* (or through) with the true act of touch—pressure with the finger-tip, increased during key-descent.

Anyway, he uses such pressure-touch in all musical passages that demand 'individualization' from note to note, tonally and durationally. Hence the quoted science figures only serve strikingly to corroborate my own teaching, viz., that one must *never hit the keys down* when trying to play musically. In this connection it has been argued that instead of key-sense the explanation is that one uses one's *memory* of previous successful or unsuccessful actions. Now this supposition is quite untenable; since we cannot possibly have any memory of a thing we have not experienced! That is, we cannot have any 'memory' of previous key-sensations unless these have proved to be possible; and thus this argument defeats itself!† Moreover, do we not also rely on

* There was a practical joker who used to go to grocery stores, ostensibly to sell eggs, and he used to hand the proprietor an *iron* egg, who would innocently put out his hand to receive it, but as he was not prepared to *feel* the egg, it would drop from his fingers, perhaps doing a lot of damage, to the great delight of our joker.

† Memory of the physical and physiological sensations indeed plays a great part in one's work. In fact, most of us rely far too much on our automatic centres when playing. Rare, indeed, is the artist who tries to feel the value of every note musically in advance, and physically during key-descent, hence so little real Music. But it certainly is "impossible and absurd" to maintain that one can play by physical memory of key-depressions, when it is at the same time denied that one can feel such!

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such key-consciousness to find the right note-places? Why do the blind succeed so well in this respect? Just because they are compelled to use this very sense, and are not tempted instead to use either the unreliable medium of the eye, or the memory for this purpose! And, after all is said and done, the transit of nerve-messages is not so slow as some figures at first sight seem to indicate. Professor Sir J. ARTHUR THOMPSON, of Aberdeen University, gives 400 feet per second as the speed—a pretty fair speed, and ample, provided we do not hit the keys down! Another thing that is overlooked is that, in reasoning about the to-and-fro messages between finger-tip and spine, it is assumed that each to-and-fro message must complete itself before the next couple can start business. Obviously, this again is quite untrue. What does happen during key-descent is that we are dealing with a *continuous*, unbroken stream of cognition pouring in upon us from our contact and muscular senses, and we provide in response a *continuous* and unbroken muscular exertion. That, anyway, is the psychological explanation, whatever the other lower sciences may say! If I unwittingly snatch up a plate that is too hot, there is a very short-lived nerve shock, for I shall most likely drop that plate with all that is upon it! But if I take up a cool plate, I receive from it an unbroken and *continuous* message of contact, and of coolness, and I also feel continuously the muscular sensation of the weight of that plate. Here we have a continuity of nerve impression, and not a quick succession of nerve impulses.

Next, let us finally unmask the folly of key-hitting, so dear to the old, now-exploded schools, because to the

<i>As to</i>	eye the use of a well-raised finger, or hand or
<i>Key-</i>	arm, seems like a hammer or 'hammerette'
<i>hitting</i>	action. As I have proved, key-hitting is bad,

because for musical passages it is impossible to 'feel the key'. But it is bad, also, for certain purely mechanical reasons. This I try to make clear at my lectures on Technique, by what I call 'The Lath Experiment'. Try it yourselves: obtain a thin lath about an inch wide and long enough to cover five or seven black keys. Placed across these keys, we here have key-resistance *exaggerated* five or seven times; and this drives home the lesson more vividly than a single key would do. Now hit the lath in the middle of its length as in using 'percussive' touch, with one finger—



and you can hit it quite hard without sounding any of the notes! Next, place the finger-tip actually on the lath, and then use 'pressure-touch' instead, and you will not have much difficulty in sounding all those notes with the one finger. In fact, you can play a five-finger exercise upon it, if you are careful to remain in the middle of the lath—sounding all the notes each time! Finally, play from a well-raised position of the finger, and sound the notes by a true 'follow-on' or ('follow-through') action, after reaching the lath each time. I follow these three experiments by striking the lath with a little wooden hammer about seven inches long, to demonstrate the folly of that pet 'little hammerette' action of the finger, so dear to the old German Konservatoriums—and one can hit quite hard with such a little hammer *without sounding any note*! And I create much amusement by (very carefully) even using a kitchen iron hammer! I then provide a similar little wooden hammer, but with a hinge in the middle of the shank, the hinge working only in one direction. With this hinged hammer I can actually hit the keys of the piano itself (and pretty hard, too) without sounding the keys—because the hinge gives way, and thus eliminates any 'follow-through' action. Whereas, if I reverse this little hammer the hinge cannot then act, and thus will allow me to supplement the hit by a follow-through (or pressure-touch) action, and I am then able to sound the notes! This, I hope, finally and for ever disposes of the 'striking the key' superstition*. The experiments of ORTMANN (via the American Steel Institute) prove that if we hit keys down, we actually lose power, owing to the concussion at the surface of the key. Now against this it is alleged that in pressure-touch we lose power instead at the bottom of the key, because it is assumed that we cannot cease our action towards tone promptly enough, and therefore must spend some of our force on the key-beds. But it is quite overlooked, that if we knock the key down we lose energy in *two* places instead of one! Tone always arises at the same point in key-descent whether we press or hit the key down! Anyway, what would it matter if there really were some such waste of energy on the key-beds, provided we *do* obtain the wished-for tone on our way down with the

* Also see Note, *The Fallacy of Key-hitting*, p. 96, *The Act of Touch*.

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We have much more force available than is ever required at the piano, so a little waste on the key-beds is no very serious matter. Besides, there cannot possibly be much waste. As the very first of my 'Relaxation Studies' proves—a test-exercise in 'Aiming' *to* tone—we can use actual 'weight-touch' and yet have the note *staccatissimo*—and that positively proves that there cannot be much loitering on the key-beds, else the key could not rebound, and we should not have our *staccato*! No, we will continue using our weight-touch and pressure-touch, and will leave unmitigated hit-touch to the unmusical.

What do I mean by Pseudo-Science? Just this: If you jump on the shoulders of Science, overbalance yourself, and topple over the other side into a mass of false deductions, then you are suffering from Pseudo-Science. When wrong conclusions are drawn from the facts, then Science is degraded into Pseudo-Science. Art, indeed, cannot be successful unless it is in strict harmony with the laws of Nature, we as know them through Science, as HERBERT SPENCER has so well said; but it needs an intervening mind and a healthy imagination to make the correct deductions from the facts†.

There is no finality in Science, new vistas are constantly opening out, and thus it is probable that we may yet find clearer and clearer explanations of piano technique itself.

* Probably we here have yet another of the many wrong deductions from scientific facts which we have encountered on this journey. It is evident that in 'pressure-touch' we do not at all waste our substance on the key-beds in the alleged way. In fact, I proved this by the experiments I made on this very point while I was busy with *The Act of Touch*. I took away the pads under the keys, and found I could obtain a full singing tone in spite of their absence. If I had "key-bedded" I should certainly have crumpled up the action! Of course, I had to be careful in my aim! What we probably do in aiming our action 'to the sound' is to aim at a point somewhat earlier in key descent, just as we have to allow for wind-pressure in aiming with a gun. Probably we do the same when we clap our hands successfully—to obtain full resonance (and that pleasant tingling sensation) we must not be too late. We probably instinctively aim at a point before reaching the skin of the other hand, thus allowing for the 'one-fifth of a second' sluggishness of muscular response which has been asserted!

† For instance, the fact that the hammer hits the string and then falls back is useful knowledge, provided we deduce from it the fact of the uselessness of trying to make tone once the key is down. But, if instead of this, the absurd conclusion is jumped to that 'therefore' one should hit the key itself, then this is a case of false reasoning at its worst!

'A prolific discoverer is continuously superannuating his earlier self.'* Therefore, let us keep an open mind, ready to welcome any new light that may show itself. But it does not follow that everything new is better. HINDEMITH is certainly newer and different from BEETHOVEN, but not necessarily better! Lately, attempts have been made to improve piano-teaching by a more minute appeal to physiological facts, and these attempts may have been praiseworthy as such; but the danger is that in trying to be more 'scientific' the result may prove actually unscientific! The most important of all the sciences for us is the youngest—Psychology—and if its mandates are overlooked in over-zealous attempts to drag in the facts of physiology then the last state of the suffering student will be worse than the first! Facts may also be interesting as such, and mind-widening, but they may also prove to be quite useless pedagogically, and worse; since dwelling upon them may easily result in wrong-doing in place of the hoped-for improvement—the facts may be true enough, but they may be inappropriate for the student to dwell upon. In that case the process is truly *unscientific*, because unwise psychologically. If we bring our minds on certain processes which we cannot influence by force of will, this not only constitutes waste of time and energy, but is mind-disturbing, and obstructive of progress, for the student's mind is led away from where it should be—and it is difficult enough at any time to bring the student's mind on the precise spot where it should be! Thus, knowledge of certain physiological details may be quite interesting, but practically quite useless and even impedimental.

For instance, there has been much talk lately of 'Fixation' and 'Tension'. Indeed, we are bound to have Tension in the muscles when we exert them, also Tension of the tendons across the joints when we use the muscles†, also Tension in the joints themselves, owing to such muscular pull across them; and, finally, that residue of Tension in the muscles (Tonicity) which we cannot alter‡. But all four of these manifestations

* From Aldous Huxley's *T. H. Huxley as a Literary Man*.

† I have shown how in one or two cases the sensation of such tension across the joints can be of use in distinguishing between right- and wrong-doing. See *Act of Touch*, p. 148, etc.

‡ See Note on 'Tonicity', *Act of Touch*, p. 154.

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of Tension are quite outside our control: they are bound to occur whenever we use a muscle, and we cannot possibly strengthen or weaken them by force of will. How useless, then, and wrong psychologically and pedagogically, to try to draw the player's attention to their presence? It may, indeed, lead to much wrong-doing, for the idea of Tension being presented to the student's mind may very likely lead to his providing that other, wilfully promptable and very bad form of Tension, which is necessarily impedimental and *defeative* when applied in any gymnastic pursuit—I mean ANTAGONISTIC Tension, or stiffness of limb, which proves to be The Very Devil when it comes between us and the production of free-and-easy piano playing! Equally reprehensible, and truly unscientific for the same reason, is it to try to dwell upon the exact locality of every muscle used in playing (even if we could be sure of their locality*), since we cannot directly will any muscle into action, and can only do so by willing the action of the connected limb, or portion of it. If a mere musician's word is not to be trusted on this point, here is what WILLIAM B. CARPENTER wrote on this point in his monumental *Principles of Human Physiology* (J. & A. Churchill), page 711: 'It may be asserted, with some confidence, that no effort of the will *can* exert that direct influence on the muscles, which our ordinary phraseology, and even the language of scientific reasoners, would seem to imply, but, on the other hand, that the will is solely concerned in determining the *result*. . . . Further, we cannot, by any exertion of the will, single out a particular muscle, and throw it into contraction by itself, unless the muscle be one that is alone concerned in an action which we can voluntarily perform; and even then we single it out by *willing the action*.' Hence the folly both psychologically and pedagogically—I repeat it—of hampering the student with the names and addresses of his muscles!

The moral of all this is, that in our work we should, to the best of our ability, make use of scientific knowledge, but also that we must all the while be urgently aware of the danger of drawing false conclusions from that knowledge, else we shall degrade Science into Pseudo-Science.

Herewith I conclude this set of articles. The fallacies

* See Additional Note XI, *The Visible and Invisible*, on this fallacy.

examined and exposed in these pages are harmful not only because they are retrograde, but because they are also psychologically unsound, and therefore inimical to true Pianistic Progress.

NUMBER SEVEN

THE PSYCHOLOGICAL ERROR

STILL they come! The latest book (Arnold Schultz*) is indeed a well-meant, sincere and painstaking effort to carry still further the physiological analysis of Technique. Four of its chapters are devoted to the attempted destruction, in turn, of Leschetitsky, Breithaupt, Ortmann and myself! But after pages of attempted refutation of my findings, the author finally admits, 'that buried in Matthey's pages . . . was an insight into piano technique unmatched by that of any other theorist'. Now, how can this be possible when most of my findings are here at first pronounced by him to be 'wrong', 'impossible', and 'absurd'? All this futility, as I have elsewhere already indicated, arises from lack of psychological insight on the part of these later writers. In their efforts to enlarge the scope of the physiological details, they quite ignore the most important science of all in the teaching of any subject, and that is the science (or, at least, the sense) of Psychology. Indeed, it is futile to try to teach touch-actions, or any other gymnastic proficiency, by providing the pupil with what may be the most precise possible catalogue of the localities of the concerned muscles, since it is impossible for us to induce any muscle to act by trying directly to will its action, and we can only obtain its co-operation by willing *the requisite limb-actions* and relaxations. Knowledge of the required exertions and passivities of the various portions *of the limb* is the only knowledge that will help us. All we can do is to learn to recognize and remember the *sensations* which accompany the desirable and undesirable changes of limb condition. That is the only way, and it is therefore a matter of Psychology all along.

I think it has been calculated that when we stand erect, and swing one leg outwards and sideways, some two hundred muscles are implicated in this simple act! Just so at the

* 'The Riddle of the Pianist's Finger' (University of Chicago Press).



Piano; for instance, the apparently quite simple action of raising a finger and lowering it is really quite complex muscularly. Now, even supposing for the moment that we could directly influence all the required muscles with their varying degrees of contraction, individually, how could we ever hope thus to master the simplest action? The whole thing is preposterous in that light! All we can do is to learn which are the needed *limb* activities and to learn to provide these movements and stresses at their easiest, with absence of all those defeating stresses—fixations—so dear to some of our present-day writers. A precise knowledge of the locality of the muscles will not here help us in the least—only a knowledge of general principles may. The essential thing is psychological perception, either innate or acquired, on the teacher's and pupil's part. In this latest book one is glad to see the action of the 'small' finger-muscles much stressed, and this certainly is a step in the right direction, for as I indicated in *The Visible and Invisible* (pp. 43-46), there are duties which are best fulfilled by these small muscles. Being at heart a psychologist, I also there noted a little exercise which serves to make clear the sensations accompanying the exertion of these small muscles alone, as distinct from their exertion along with those of their bigger brethren. Indeed, for light, running passages try if possible to avoid using the tendons that transmit the force of the strong finger muscles, situated somewhere on the forearm. Just here is a case where a general (as opposed to a particular) knowledge of muscle-locality is useful; since by avoiding certain tensions across certain joints, we can learn to avoid using muscles which are not required. The use of these small muscles alone, however, provides but a precarious form of technique with which to combat the comparatively clumsy action of our modern Pianoforte; and help from the hand and forearm rotation is therefore usually needed. We certainly cannot deal with BEETHOVEN passage-work without such help, and also that of the strong or 'long' muscles themselves.

This book, well meant as it is, however loses its practical value because of the fallacies advocated therein, and because of the insufficiently considered attacks on the teaching of others. My own teachings have manifestly often been quite thoroughly misunderstood, and my latest book, *The Visible and Invisible*, apparently has not been studied at

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all! Much error has also arisen owing to non-apprehension of the fundamental distinction between the making of *Sound* and the making of *Duration*. He constantly tells us that certain ways of producing tone are 'incapable of producing *legato*'. The truth is that with one solitary exception there exists no correct form of producing tones which is not equally serviceable both for *staccato* and *legato*!—provided the action is accurately aimed to tone in the first place! * Our author is also much preoccupied with his own new terminology; but a new terminology does not necessarily imply the perception of any new facts, or a better understanding of the old ones!

But life is too short to take up in detail all the points here needing rebuff; it would need a volume as large as his own!

I cannot, however, resist giving just one instance:

Referring to the term, 'Second species of Touch' (which I adopted in 'The Act of Touch'), he tells us again and again that such *second species* (exertion of the finger and hand, along with a basis of self-supported arm) is 'impossible'—'*second species is incapable of producing tone*'—'an arm completely supported by its elevating muscles without contraction of the antagonistic depressors cannot serve as a basis for a playing unit' . . . 'Second species . . . are capable of no tone at all' . . . 'the second species as he (T. M.) defines it is incapable of depressing the key at all' . . . 'the impossible second species', etc. It is quite ignored that the fully self-supported arm nevertheless does offer quite a substantial basis, because of the inertia of its mass—quite a sufficiently ponderous basis for certain touches; a fact which other writers also have overlooked. Yet the truth is that one is quite safe in asserting that there are thousands of pianists and teachers all over the world who every day successfully use this maligned 'second species' just precisely as I have described it (finger and hand exertions along with self-supported arm) and play both *legato* and *staccato* equally well by means of this muscular combination, and with plenty of inflection, too, and also equally well either by means of the 'bent' or 'flat' finger action—or that halfway finger action (neither bent nor

* The only exception is the one which by its inherent nature excludes *staccato*, and that is 'Weight-transfer' touch, when we must of necessity play *legato* or *legatissimo*.

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flat) which many pianists employ preferably; and, indeed, without any 'fixated' arm whatsoever. Moreover, they have done this long before I was born.

After thus at first perversely condemning this poor 'second species' as incapable even of depressing keys, or of producing *legato*, it is, however, later on rehabilitated as 'Contra-fixation touch', with perhaps a base of 'arm which is fixed by antagonistic muscles'; and then, with this new terminology, 'all is well', and our previously despised 'second species' is henceforth allowed to live on peacefully and usefully!

To sum up: We cannot teach technique by providing the names and addresses of muscles; although such knowledge may be interesting. We can only help our students and ourselves by gaining a clear vision of the needed correct limb movements and invisible stresses, and by realizing the *sensations* which accompany such correct muscular factors. Now this, all along, comes under the science of Psychology—hence the folly of ignoring its mandates!

NUMBER EIGHT

ON QUALITY OF TONE, AGAIN!

SOME conclusions drawn in an article by Professor Carl E. Seashore on Piano Touch which appeared in *The Scientific Monthly* of October 1938 seem to need combating. Apparently, Professor Seashore partly subscribes to the scientific superstition that the act of Touch cannot influence tone-quality without a corresponding diversity in intensity, and he makes an almost libellous statement, viz., that 'Money is spent in trying to teach pupils to do something that cannot be done'. However, I am glad to read in his peroration that he admits that 'the artist may legitimately think and perform with tone-quality as his objective and consciously control his touch in terms of tone-quality'. Now, that is precisely what we artists are out for, hence it is quite a sound 'economical problem' for people to pay us for showing them how to accomplish this!

In past days the hoary old scientific superstition was, that 'quality differences are impossible "because" of the hammer being thrown at the string for the last part of its journey'. Later on, however, this was modified into:

'impossible without a corresponding change in loudness'. So far, however, this belief seems to rest solely on bare reiterated assertions, and, so far, no successful actual experiments in support of these assertions have come under my notice. The 'Iowa Piano Camera' has been quoted by some as giving such proof, but this seems to be a total misapprehension, since there is apparently no provision whatever in this camera for the recording of quality contrasts, and it seems solely to record Intensity and Duration*.

Now, whatever may prove to be the ultimate explanation of these differences in quality (which it is now fully admitted *are* obtainable) it is quite certain that no such explanations can possibly alter or affect the *teaching* of Touch. It remains quite certain that, if we choose to 'dig' into the keys with a forward jerk of the upper arm in conjunction with a down exertion of the forearm (and with consequent rigid wrist and elbow), then the tonal effect will be altogether obnoxious and insulting to the musical ear (even when done by otherwise fine artists), and that it is actually damaging to the instrument itself. Whereas, if we avoid this malpractice, and instead, use our limb (finger, hand and arm) under the correct conditions, now well-understood as so-called 'Weight-touch', with an accelerated key-depression, then the tones will be fully controlled, and pleasant even to the most sensitive and fastidious musical ear. There is therefore no doubt about the relative demerits and merits of the jerked-down key *versus* the accelerated key.

Personally, along with most musical people, I remain convinced that a measure, anyway, of tone-quality differences is achievable independently of Intensity. Moreover, it seems clear that the explanation of this possibility will ultimately be found to lie in the 'bendability' of the hammer-shank†. It is quite a fallacy to compare the hammer-head to a ball thrown at the strings (as Professor Seashore suggests), since the hammer (unlike the ball) remains tied to the Piano action by its hinge. Hence it is fair to assume that the resiliency of

* The experiments of OTTO ORTMANN on this point are not at all conclusive, on his own showing. What we need is an instrument which, while it records gradations of Intensity, also records the presence or absence and *relative intensity* of those upper harmonics which are the cause of quality-variations. So far as I am aware this has not yet been devised.

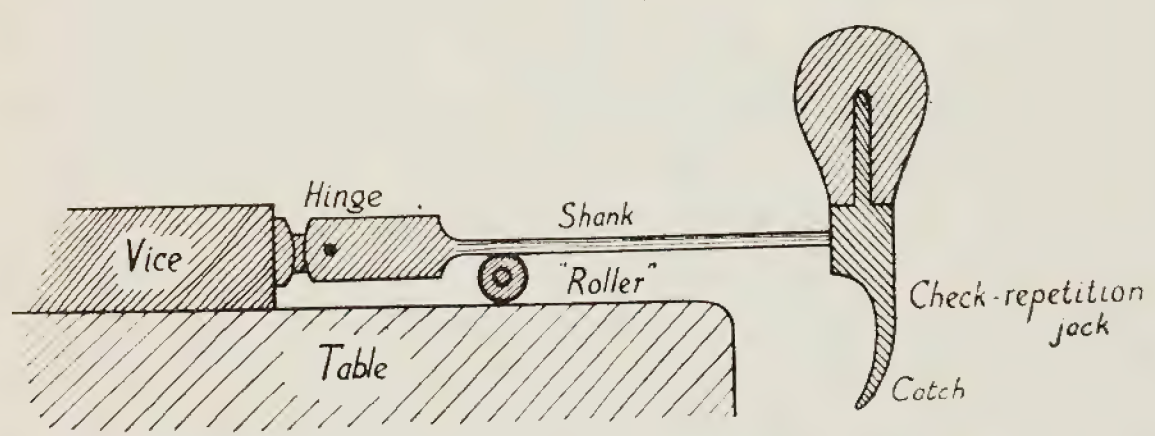
† I already mooted this explanation some thirty-five years ago, in my *Act of Touch*!



the hammer-shank can quite well influence the 'throw'. Evidently the hammer-shank *gives* during a jerk touch impulse, and that in regaining its unbent position as the hammer-head reaches the string there will ensue a raking action upon the string (a sliding instead of direct action), quite enough to account for the production of those harsh upper harmonics which are acknowledged to be the cause of harsh tone—in accordance with HELMHOLTZ'S discoveries in the past. To prove this bendability of the hammer-shank, obtain a spare hammer from any of the makers and try the following experiments:

Experiment 1: Screw the *heel* of the hammer-shank *sideways* tightly to a table by means of a vice, so that it cannot move, but screw it to the table with an intervening thin piece of cardboard or board, so that the hammer-head itself is free to move. Now you will find, if you tap the hammer-head with your finger (even gently) that the shank easily gives way and trembles, even to the unassisted eye—quite sufficiently, therefore, to be the cause of the hammer-head 'raking' upon the string.

Experiment 2: Fix the base of the *hinge-flange* of the hammer in a vice, or press it firmly upon a table and arrange it so that the hammer can lie on the table by its 'roller', but also so that the heel of the hammer-head is free over the edge of the table, thus:



Now raise the hammer by its head and let it fall upon the table and it will be seen to rebound violently. Obviously, that is because the shank is resilient. True, it may be claimed that the leather of the 'roller' is resilient; and, no doubt, that may help, but it is not sufficient by itself to account for such a marked rebound.

Finally, the fact that the Piano maker has been compelled to add a 'check repetition jack' to his action, surely is proof enough of the shank's resilience? If that were not so, no such jack would have been required!

Conclusion: If you play quite softly you cannot make harsh sounds, because you cannot then jerk the hammer-head sufficiently to make the shank give. Beyond *mf* or *f*, however, you can make harsh effects quite easily if you jerk the key enough, yet you can avoid such harshness by using the proper accelerative touch-forms.

In the end, therefore, it does not in the least matter to the teacher or player what may ultimately prove to be the final explanation. Enough, that in the first case the tonal effect is hideous, and, in the second, it is not; and besides, it is only with the *accelerated* key-depression that you can accurately control and inflect your tones!

NUMBER NINE

THE SCALE SPECTRE

*An Examination Crime!**

MOST heartily do I welcome Mr Percy Scholes's spirited and justified attack, in *The Music Teacher*, upon the insensate and musically deadening orgy of 'Technical Exercise' requirements still perpetuated by all our examination bodies in spite of all the progress that has been made in teaching knowledge these last fifty years; and I gladly accede to his invitation to state my views. They are, indeed, more violent than his, for I do not hesitate to denounce this anachronism to be a Crime against Education—a crime against musical progress, and therefore against progress in general education.

This requirement of an interminable array of scales and arpeggios, and leagues of technics, is a bad inheritance from the past. It was felt to be necessary, since at that time there was practically complete ignorance of the fundamental causes of right-doing and wrong-doing pianistically. The simple facts and laws were not understood, obedience to which constitute ease in agility and control of tone, and disobedience to which prevent their attainment.

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They are but simple physical, psychological and physiological facts, such as the *nature* of the required key-movement, the sensing and timing of it, and the requisite arm, hand and finger conditions*.

Hence, to the old teachers there seemed no other road open towards the acquisition of keyboard agility and tone-control than by the practice of countless technics, scales and arpeggios, etc., inflicted with the precarious hope that the unfortunate would-be music learner might thereby, some day, chance to discover for himself the true processes and rationale of touch and right-doing. Whereas, he usually failed to do so. Nowadays, however, when every teacher worth his salt does at least know something of the main facts, every child from the age of four or so can be, and should be, instructed in the difference between right- and wrong-doing pianistically; hence we can now hear children of quite tender age, and of quite ordinary gifts (with a modicum of brains and ear) who evince a mastery of technique which, in the past, was only witnessed in the case of an exceptionally gifted artist. Thus is wiped out at one stroke the obsolete reason for that gargantuan mass of useless and soul-destroying mechanical *mis*-practice formerly thought necessary, and which so often led to the acquisition and endurance of thoroughly wrong habits, so exceedingly difficult to eradicate afterwards.

This interminable grinding out of technics—automatic practice—which is still countenanced and indeed insisted upon at our examinations, is probably one of the reasons why our education authorities are still so reluctant (in spite of some hopeful concessions) to accept the study of Music-

* These last, the physiological facts, could, for agility, be summarised as the use of the 'poised' arm in spite of the required *separate* and momentarily applied exertions (not *movements* necessarily) of the hand and forearm rotationally, both of which are needed to help each and every finger in turn; for thus alone can be eliminated that jammed-down state of hand and arm which so often destroys all 'finger individualization' and all ease of transit across the keyboard. The obsolete notion of 'equalizing all the fingers' by the practice of endless five-finger exercises (embracing it was hoped, all the possible note-successions!) was of course a gigantic futility, engendered by complete ignorance of the *invisible* incidence of the forearm rotation element, and individualized hand exertions. Rotational stresses and *continuous* hand stresses were consequently constantly applied when they should *not* be, and the resulting stiffness made certain of the fingers seem weak and helpless, whereas all the fingers are equally serviceable at the keyboard the very moment that such errors are eliminated. What has to be learnt is to *avoid* those wrong rotational stresses, and continuous hand exertions, almost invariably made at first.

performance at its proper, true and full value as an optional school subject. Yet, when rationally pursued, practice in music is indeed one of the most direct—the most compelling means of training the mind towards that mastery of *Concentration* which is at the root of all true education.

These futile examination impositions were devised some fifty years ago, obviously in complete innocence of all Education-psychology. Yet there they have remained unchallenged to this day (except by some supposed iconoclasts!) owing apparently to the lack of thought, initiative, and courage on the part of the musical profession.

To insist on the unfortunate music student strumming for endless hours at scales, major, melodic and harmonic minor, and chromatic, so that he can promptly begin at any point—‘from below or from above, an octave apart, or a third or sixth apart, or from the centre or extreme ends, on the same note or a third or sixth apart, etc.’, surely is just as idiotic a requirement, as it would be to expect an elocution candidate to juggle with the *sounds* of the alphabet in the same way, backwards and forwards alternately, etc.; surely this would not help the elocutionist to be a better see-er of poetry, any more than does our enforced scale-strumming help towards musicianship and music-making; and we know how often it has proved destructive of a budding love for music! Moreover, such mechanical work tends to induce dissociation just where our every effort should be to enforce the strongest possible bond—that is, that imperatively needed close bond of association between technical means and musical sense and imagination†.

Of course, all this is only too well in keeping with those mid-Victorian ideals of education, which were out at all costs to stifle the natural bent of the healthy child for knowledge, and to make all learning as loathsome as possible, under the notion that this would form good ‘mind discipline’! But let there be no misunderstanding—

† Why did these dear old pundits not also ask for all the contrary-motion scales, also ‘commencing a second, or fourth, or fifth, or seventh apart, and from the centre or extreme ends, and starting on any note of the scale’? It would have added several more hundred—useless—tests! What a glorious opportunity was here lost to inflict additional misery and purgatory on the luckless music student!

ing here. We are not demanding the total abolition of all five-finger exercises and scales, etc. What is urgently demanded is that the totally exaggerated requirements of a bygone age shall be reduced to sane proportions by *all our Examining Bodies*, and brought into line with present-day knowledge of teaching.

Certainly, in the earlier days of studentship, some practice of five-finger exercises, scales and arpeggios is absolutely essential. Such practice serves as a convenient vehicle for *applying* the knowledge gained, and for transforming it into technical *habits*; and to help towards the acquisition of a sense of tonality, and elementary rhythmical sense (both perhaps no longer needed in some modern pseudo-music!), and so as to learn the fundamental keyboard fingering-shapes.

Every student in the early stages must gain familiarity and facility in these directions, but how much he needs, and when exactly, should depend upon each individual case. Examination procedure, however, demands that such requirements shall be definite for each artificial 'grade' laid down; and this drawback cannot be escaped so long as examinations remain in vogue; and examinations do, after all, serve a very useful purpose, for they stimulate the naturally lazy student and teacher, giving him tangible and material aims; although, ethically, a love for music itself should suffice as a prompting to one's best endeavour. Human nature, however, being what it is, the examination device remains quite a commendable thing. But we must insist that it is brought into line with present-day needs, and that it does not serve to perpetuate the educational misdoings of the past. It is everyone's duty to insist on this being done; and we must clamour aggressively—nay, truculently—if this evil is to be overthrown.

After the scale and arpeggio fingering positions have been learnt for the second and third examination grades, there should be no further scale and arpeggio *formulas* for the higher grades, as this only leads to waste of valuable musical time, and a deadening of musical susceptibilities. For the convenience of examiners, however, they might have the option (in the higher grades) of calling for the performance of a scale or two, or common chord or dominant seventh arpeggio *as a test for evenness and agility*, in those cases where there seems

doubt on these points owing to the chosen pieces and studies failing to exemplify these sufficiently. But in these cases the particular test examples chosen *should be at the option of the candidate*, since any scale or arpeggio will serve equally well for this purpose; and thus will be avoided the abuse of such tests, and so much useless treadmill practice.

For the higher grades and teaching diplomas the examiners should also have power to ask the candidate to exemplify octave playing in scales, and *also in arpeggios*; and specially for the diploma as teacher, knowledge of the fingerings of all double-thirds scales is also a just requirement.

Certainly, in the later stage of studentship and the artist-stage, a few 'occasional' technics may still prove helpful, when particular difficulties are encountered, or to warm up one's fingers on a cold morning, or to realize or revive one's touch-sensation of the particular instrument used. The 'closest position' arpeggio (taken at full speed) forms one of the best of such technics, since it is impossible to 'keybed' (anyway, with one of the two hands used) when such arpeggios are played quite quickly and lightly, and, in fact, *staccato*. Yet this needs only some five or ten minutes' practice—not hours of mis-practice!*

When the underlying facts of technique have been mastered, all that is needed to keep one 'in form' is the practice of a few selected Chopin studies, or other *musical* studies, some Bach, Scarlatti, etc., and something of the nature of Beethoven, with his hefty finger-passage work; and perhaps also a few—very few—actual but purposeful technics, mainly designed to waken up the *side to side* movements of the fingers, thumb, hand, and wrist-joint. But all else in the way of technic-strumming is sheer waste of time—and worse—since it tends to alienate technique from music, instead of making stronger the bond between the two.

All else, in the way of technical practice is not only waste of time, but must tend to alienate technique from music, instead of associating the two, as should be.

* Of course, if the artist does not know *how* he produces his technical effects (when he gets them successfully), that is another matter! We know of one celebrated artist who confesses that he has to 'remake his technique' every morning of his life by lengthy exercise practice! But what a woeful confession of time-waste, which a little better *knowledge* of his craft would save him—and life is so short and Art so long!

Finally, we are told that it is certain that our general education schemes are about to come into the melting-pot for complete revision—and it certainly is necessary. Why should not we musicians begin at once and put our own house in order, and insist on our examination schemes being brought up to date? It is certain that if these much-needed reforms are carried out, all our music exams. will become far more popular!

The Associated Board, some ten or twelve years ago, did make a praiseworthy effort to correct its Primary-grade requirements—the most important of all; but it was only tentative, and was afterwards unfortunately discarded. Indeed, I have found that it usually takes some twenty years or so to induce a body, board, or council to budge an inch out of its usual routine. Let us, therefore, hope that the present crisis (where speedy amendment is so imperatively important for the future of music in this country) will prove an exception to the rule!